



## A Case Series on Simultaneous Pancreas Kidney Transplantation

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### ABSTRACT

Simultaneous pancreas kidney transplantation (SPK) performed as the universal treatment for patients who have type 1 diabetes mellitus and ESRD. Here we present a case series of 4 SPK cases, successfully performed. Successful SPK transplantation increase patient survival enhances quality of life, and decline diabetic complications. Suitability of SPK transplantation is dependent upon patient selection including their age and comorbidities. All patients received transplanted organ from cadaveric donor. This article discusses with immunosuppression consists of induction and maintenance therapy. Allograft dysfunction is a serious issue, after transplantation of kidney. Management of ACR and AMR has been discussed in the fourth case.

**Keywords:** Simultaneous pancreas kidney transplantation (SPK), End stage renal disease (ESRD), Tacrolimus (TAC), Acute cellular Rejection (ACR), Antibody mediated Rejection (AMR).

### INTRODUCTION

Simultaneous pancreas and kidney transplantation (SPK) performed as the universal treatment for patients who have type 1 Diabetes mellitus and ESRD. Several studies revealed that combined transplantation can increase patient's quality of life and long term survival<sup>1</sup>. The people aged 64 years old have diabetic ESRD and are associated with an increased morbidity and fatality<sup>2</sup>. Successful SPK gives freedom from dialysis and increased physiologic glucose metabolism<sup>3</sup>. All of our patient had successfully undergoing simultaneous pancreas kidney transplantation. These patient have other appearances of diabetes, including nephropathy, retinopathy. Suitability of SPK transplantation is dependent upon patient selection including their age and comorbidities. All our patient < 50 year old, BMI <30 kg/m<sup>2</sup>, cardiovascularly they were fit. Once the workup is completed they are undergoing transplantation. In these cases both transplanted organs taken from cadaveric donor. All of these patients were getting immunosuppressant as per the protocol. Immunosuppression will be based on Basiliximab induction. Acute and chronic allograft dysfunction, graft loss are the major reason for antibody mediated rejection. Several methods are used for the treatment of AMR, Antibody removal/neutralization, Anti B-Cell therapies, Antiplasma cell therapy, Anti-T-cell therapies, conversion to Tacrolimus based regimens<sup>4</sup>.

### Case History

#### Case 1

35 year old male was diagnosed Type 1 DM with ESRD. He was admitted for cadaveric simultaneous pancreas kidney transplant. After confirming the suitability of the

deceased donor graft he was taken to OT. Simultaneous pancreas kidney transplant was performed. He tolerated the procedure well. Postoperatively he was shifted to transplant ICU for further care. Immunosuppression was started based on Basiliximab induction. He was given inj. Methyl prednisolone 7 mg/body weight bolus at the start of implant of pancreas, Inj. Basiliximab (First dose-20 mg within 2 hours of implant and second dose -20 mg on 4<sup>th</sup> day), Inj. Methyl prednisolone 125 mg on day 1 and 80 mg on day 2, and T.Wysolone 30 mg on day 3. For maintenance therapy, patients Received Tacrolimus, Mycophenolate Mofetil 500 mg BD. He was found to have good urine output and sugar was below 140mg/dl. He was started on liquids followed by semisolid diet. His implanted kidney also started working and creatinine started coming down. His RFT and sugar levels were monitored regularly and was found to be within normal limits. DTPA (diethylenetriaminepentacetate) scan for kidney was also normal.Both drains andFoleys catheter was removed. He had a steady recovery and tolerated normal diet and bowel started moving. Serum Tacrolimus levels were monitored regularly and the tacrolimus doses were adjusted according to the serum value. He is being discharged in a stable state.

#### Case 2

30 Year old female was diagnosed with Type 1 DM, CKD, diabetic nephropathy, diabetic retinopathy and acute pancreatitis. She was admitted for simultaneous kidney +pancreas transplant from a cadaveric donor. After preanaesthetic evaluation SPK transplant was performed. Postoperatively she was shifted to transplant ICU for further care and stabilization. She was started on immunosuppressants as per the desired tacrolimus levels. Her blood sugars, pancreatic enzymes and RFT were



under continuous monitoring. The patient developed vomiting episodes along with positional vertigo for which an ENT consultation was sought and she was put on regular antiemetics and cinnarizine tablets. Later, she again started developing recurrent high grade fever episodes despite broad spectrum antibiotics. Blood culture were negative and the urine culture showed heavy growth of E-coli and Klebsiella. She was put on tigecycline to which she partially responded. At the time of discharge she was comfortable.

### Case 3

34 Year old female was diagnosed with Type 1 diabetes mellitus, End stage renal disease. The patient was admitted for cadaveric Simultaneous Pancreas Kidney transplantation. Postoperatively she was shifted to transplant ICU for further observation and stabilization. Later, she developed mild hemodynamic instability for which supports were started. Her creatinine showed rising trend for which hemodialysis had to be initiated. She had developed thrombotic microangiopathy. Tacrolimus was withdrawn. She was given broad spectrum antibiotics, antifungal and immunosuppression. Gradually her condition improved. She had good urine output with improving RFT. Once her creatinine levels dropped near normal, she was started on Tacrolimus along with Mycophenolate and prednisolone. She is being discharged in stable condition.

### Case 4

36 Year old female was diagnosed with type 1 DM, ESRD, HTN and diabetic retinopathy, neuropathy, nephropathy. The patient was admitted for Simultaneous pancreas transplantation. Post operatively she was shifted to ICU for further care. She was started on immunosuppressants (TAC, Cellcept (mycophenolatemofetil) and Everolimus). Her post-operative drain amylase and lipase were acceptable but her post OP labs showed elevated serum creatinine level for which a renal biopsy was taken. Renal biopsy reported as Acute cellular Rejection (ACR) +Antibody mediated Rejection (AMR) for which her immunosuppressant levels were adjusted according to the serum levels. She continued with elevated creatinine and in view of ACR and AMR she has been given immunoglobulin's (4 doses on 4 days). She was also given Rituximab (2 doses – 500 mg). At the time of discharge she was comfortable.

## DISCUSSION

Combined procedure of transplanting both the kidney and pancreas in a single surgical operation particularly effective for patients who have type 1 DM and ESRD. More than two thirds of pancreas transplants are done by simultaneous pancreas kidney transplantation, others are performed as sequential pancreas after transplantation of kidney or pancreas transplant alone<sup>5</sup>. In type 1 diabetic patients on dialysis, the patient survival was 5 year, for young patients, ranges from 25% to 35% and after the transplantation 80% increase in the patient

survival rate<sup>6</sup>. Early recognition and anticipation is necessary to improve the quality of life of chronic renal failure patients<sup>7</sup>.

In first case, the patient was well and tolerated the procedure. Post operatively he was shifted to transplant ICU. Immunosuppression was given and it is based on Basiliximab (interleukin 2-receptor antibody) induction therapy. The standard regimen of antibody induction and maintenance with tacrolimus, Mycophenolate mofetil ± steroids. According to our hospital protocol inj. Methyl prednisolone and T. wysolone are used as steroids. Advantage of higher dose of intravenous immunosuppression given at the period of transplantation help to prevent acute allograft rejection, reduce the doses of maintenance therapy, and also stimulate the growth of regulatory immune cells that suppress all reactivity. His sugar and RFT level are monitored regularly and was found to be within normal level. Serum Tacrolimus (Pangraf) level was found to be 1.6 ng/ml.

CT abdomen was taken to rule out intra-abdominal collection and it showed a small 1.2 cm pseudo aneurysm in the mesentery of the graft pancreas. There was no evidence of any collection in the abdomen.

In the second case the patient was on ventilatory support during first two days following transplant from which she was weaned gradually and was extubated. She was started on immunosuppressants. The Duplex graft showed normal flow and perfusion to the graft. Her urine culture sample grew E.Coli, for which Carbapenem were started. Creatinine levels are elevated, for which nephrology opinion sought and she was started on hemodialysis. Gradually her condition improved and shifted to ward. The patient had developed high grade fever for which antibiotics were started. Serum Tacrolimus level was found to be 6.5 ng/ml.

In the third case she was started on immunosuppressants (Basiliximab induction). She maintained a good urine output in immediate postoperative period. The drain had acceptable output. Subsequent labs showed trend of Hb drop, hence blood transfusions were given. Later she also developed mild hemodynamic instability for which supports were started. Her creatinine showed rising trend for which hemodialysis had to be initiated. A peripheral smear and hemolytic workup was done in view of consumption coagulopathy like pictures in labs. Diagnosed the possibility of Thrombotic Microangiopathy. Tacrolimus was withdrawn. She was given broad spectrum antibiotics, antifungals, and immunosuppression according to the protocol. Later her condition was improved. She had a good urine output with improving RFT. She was started on Tacrolimus along with Mycophenolate and prednisolone after the creatinine level was dropped to normal.

In the fourth case She was started on immunosuppression (TAC, Cellcept and Everolimus). An MDCT (multidetector



computed tomography) was done to rule out any collection which was reported as normal study. Serum TAC level was found to be 2.64 ng/ml. Her serum creatinine levels was elevated for which renal biopsy was taken. Renal biopsy report was shown that ACR+ AMR. Therapy for AMR needs a combination of several methods, such as plasmapheresis or immune adsorption, intravenous immunoglobulins, Rituximab, bortezomib<sup>8</sup>. She has been given with immunoglobulins (4 doses on 4 days). She was also given Rituximab (anti-CD20 monoclonal antibody)- 2 doses – 500 mg .Her last TAC level was 2.3ng/ml and Everolimus level 0.39ng/ml.

### CONCLUSION

SPK transplantation is the current treatment for patients who had type 1 DM and ESRD. It addresses renal failure and brings physiological means of achieving stable insulin secretion. Even though it encompasses major surgery and is not without threats, SPK transplantation however rises the patient survival, improves quality of life and freedom from diabetes related complications and dialysis. This also avoids frequent blood sugar testing and occurrence of life threatening hypoglycemia's. Immunosuppression therapy and management of rejection is very important for a successful transplantation. The chance of rejection or other transplant complication is very high during the early period. Checking the creatinine during this period will help to prevent such events.

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